**ANNEX**

| | |
|---|---|
| Exposure scenario | **ES1: Worker (industrial); Manufacturing**<br>**ES2: Use as a chemical intermediate (downstream user)**<br>**ES3: Use as a monomer (downstream user)**<br>**ES4: Formulation of coatings**<br>**ES5: Industrial use of coatings (e.g. beverage can)**<br>**ES6: Industrial use of coatings (e.g. automotive refinishing)**<br>**ES7: Professional and consumer use of coatings**<br>**ES8: Formulation and use of non-metal surface treatment solutions/dispersions**<br>**ES9: In situ non-metal surface treatment**<br>**ES10: Formulation of sealants**<br>**ES11: Industrial use of sealants**<br>**ES12: Professional and consumer use in sealants**<br>**ES13: Laboratory reagent**<br>**ES14: Use in textiles**<br>**ES16: Use in semiconductor and electronic manufacture** |

---

## 1. Short title of exposure scenario

**ES1: Worker (industrial); Manufacturing**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU8 | Manufacture of bulk, large scale chemicals (including petroleum products) |
| | SU9 | Manufacture of fine chemicals |
| | SU19 | Building and construction work |
| Product category | PC1 | Adhesives, sealants |
| | PC9a | Coatings and paints, thinners, paint removers |
| | PC19 | Intermediate |
| Process category | PROC1 | Use in closed process, no likelihood of exposure |
| | PROC3 | Use in closed batch process (synthesis or formulation) |
| | PROC4 | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| | PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| Article category | | not applicable |
| Cat. release to the environment | ERC1 | Manufacture of substances |
| | ERC2 | Formulation of preparations |
| | ERC6a | Industrial use resulting in manufacture of another substance (use of intermediates) |
| | ERC6c | Industrial use of monomers for manufacture of thermoplastics |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
engeniering controlled

Take measures to prevent the build up of electrostatic charge.
Avoid humidity.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
An operator controls the manufacturing processes and takes samples for analysis using recommended personal protection equipment see chapter 8.
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).
Empty, clean and dry system / system components completely before maintenance and repair work is done.
Retain drowns in sealed storage pending disposal or for subsequent recycle.
Keep locked up. The product should only be handled by trained personnel.
Prevent unauthorized access.

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | 15 - 60 minutes/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 350 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 3600 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | not applicable |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 10286 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 0 % |
| Compartment | sewage water |
| Emission or Release Factor | 0 % |

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective |

| | |
|---|---|
| | equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

### 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

### 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC1 |
| Value | 0.34 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC2 |
| Value | 0.14 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC3 |
| Value | 0.034 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC4<br>PROC8b<br>PROC9 |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC5 |
| Value | 0.07 mg/kg bodyweight/day |
| Remarks | > 4 hours |

| | |
|---|---|
| | using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC1 |
| Value | 0.019 mg/m3 |
| Remarks | 15 minutes - 1 hour |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC2 |
| Value | 0.19 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC3 |
| Value | 0.58 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC4<br>PROC5 |
| Value | 0.96 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.14 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC9 |
| Value | 0.48 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES2: Use as a chemical intermediate (downstream user)**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU8 | Manufacture of bulk, large scale chemicals (including petroleum products) |
| | SU9 | Manufacture of fine chemicals |
| Product category | PC19 | Intermediate |

| | | |
|---|---|---|
| Process category | PROC1 | Use in closed process, no likelihood of exposure |
| | PROC2 | Use in closed, continuous process with occasional controlled exposure |
| | PROC3 | Use in closed batch process (synthesis or formulation) |
| | PROC4 | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| Article category | | not applicable |
| Cat. release to the environment | ERC6a | Industrial use resulting in manufacture of another substance (use of intermediates) |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
engeniering controlled
Take measures to prevent the build up of electrostatic charge.
Avoid humidity.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
An operator controls the manufacturing processes and takes samples for analysis using recommended personal protection equipment see chapter 8.
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).
Mechanics repair and maintain manufacturing and dispersing equipment after complete emptying and cleaning the equipment.
Retain drowns in sealed storage pending disposal or for subsequent recycle.
Keep locked up. The product should only be handled by trained personnel.
Prevent unauthorized access.

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | 15 - 60 minutes/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 250 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 250 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | not applicable |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 1000 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 0 % |
| Compartment | sewage water |

| | |
|---|---|
| Emission or Release Factor | 2 % |

## 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC1 |
| Value | 0.34 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC2 |
| Value | 0.14 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC3 |

| | |
|---|---|
| Value | 0.034 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC4<br>PROC8b |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC1 |
| Value | 0.019 mg/m3 |
| Remarks | 15 minutes - 1 hour |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC2 |
| Value | 0.19 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC3 |
| Value | 0.58 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC4 |
| Value | 0.96 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.14 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES3: Use as a monomer (downstream user)**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU8 | Manufacture of bulk, large scale chemicals (including |

| | | |
|---|---|---|
| | | petroleum products) |
| | SU9 | Manufacture of fine chemicals |
| Product category | PC19 | Intermediate |
| Process category | PROC1 | Use in closed process, no likelihood of exposure |
| | PROC2 | Use in closed, continuous process with occasional controlled exposure |
| | PROC3 | Use in closed batch process (synthesis or formulation) |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| Article category | | not applicable |
| Cat. release to the environment | ERC6c | Industrial use of monomers for manufacture of thermoplastics |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
engeniering controlled
Take measures to prevent the build up of electrostatic charge.
Avoid humidity.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
An operator controls the manufacturing processes and takes samples for analysis using recommended personal protection equipment see chapter 8.
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).
Mechanics repair and maintain manufacturing and dispersing equipment after complete emptying and cleaning the equipment.
Retain drowns in sealed storage pending disposal or for subsequent recycle.
Keep locked up. The product should only be handled by trained personnel.
Prevent unauthorized access.

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | 15 - 60 minutes/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 250 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 250 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | not applicable |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 1000 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 0 % |

| | |
|---|---|
| Compartment | sewage water |
| Emission or Release Factor | 2 % |

## 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC1 |
| Value | 0.34 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC2 |
| Value | 0.14 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal |

| | |
|---|---|
| | PROC3 |
| Value | 0.034 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC4<br>PROC8b |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC1 |
| Value | 0.019 mg/m3 |
| Remarks | 15 minutes - 1 hour |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC2 |
| Value | 0.19 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC3 |
| Value | 0.58 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC4 |
| Value | 0.96 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.14 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES4: Formulation of coatings**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |

| | | |
|---|---|---|
| | SU10 | Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| Process category | PROC1 | Use in closed process, no likelihood of exposure |
| | PROC3 | Use in closed batch process (synthesis or formulation) |
| | PROC4 | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| | PROC8a | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| | PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| Article category | | not applicable |
| Cat. release to the environment | ERC2 | Formulation of preparations |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 200 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 40 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Covers percentage substance in the product up to 1 % |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 200 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 0.25 % |
| Compartment | sewage water |
| Emission or Release Factor | 0.5 % |

## 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC5 |
| Value | 0.014 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8a |
| Value | 0.14 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b |
| Value | 0.07 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |

| | |
|---|---|
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC9 |
| Value | 0.0007 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC5 |
| Value | 1.9 mg/m3 |
| Remarks | 15 minutes - 1 hour |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8a |
| Value | 97 mg/m3 |
| Remarks | > 4 hours |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 49.24 mg/m3 |
| Remarks | > 4 hours |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC9 |
| Value | 9.6 mg/m3 |
| Remarks | > 4 hours |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES5: Industrial use of coatings (e.g. beverage can)**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU2b | Offshore industries |
| | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU4 | Manufacture of food products |
| | SU17 | General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| | SU18 | Manufacture of furniture |
| Product category | PC9a | Coatings and paints, thinners, paint removers |
| Process category | PROC7 | Industrial spraying |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| | PROC10 | Roller application or brushing |
| | PROC13 | Treatment of articles by dipping and pouring |
| Article category | | not applicable |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.

Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

### 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 200 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 4 tons |

### 4.1 Physical form

**liquid**

### 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Covers percentage substance in the product up to 1 % |

### 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 17.5 kg/day |

### 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 1 % |
| Compartment | sewage water |
| Emission or Release Factor | 0 % |

### 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b<br>PROC13 |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC10 |
| Value | 1.37 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC7 |
| Value | 9.7 mg/m3 |
| Remarks | > 4 hours |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.29 mg/m3 |
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC10<br>PROC13 |
| Value | 1.9 mg/m3 |
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

## 1. Short title of exposure scenario

**ES6: Industrial use of coatings (e.g. automotive refinishing)**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU17 | General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| Product category | PC9a | Coatings and paints, thinners, paint removers |
| Process category | PROC7 | Industrial spraying |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| Article category | | not applicable |
| Cat. release to the environment | ERC5 | Industrial use resulting in inclusion into or onto a matrix |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 312 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 0.4 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Covers percentage substance in the product up to 1 % |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 1.3 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 36 % |
| Compartment | sewage water |
| Emission or Release Factor | 3 % |

## 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC7 |
| Value | 0.0021 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b |
| Value | 0.0007 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC7 |
| Value | 0.97 mg/m3 |

| | |
|---|---|
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.29 mg/m3 |
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES7: Professional and consumer use of coatings**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU21 | Consumer uses: Private households (= general public = consumers) |
| | SU22 | Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| Product category | PC9a | Coatings and paints, thinners, paint removers |
| Process category | PROC10 | Roller application or brushing |
| | PROC11 | Non industrial spraying |
| | PROC19 | Hand-mixing with intimate contact and only PPE available |
| Article category | | not applicable |
| Cat. release to the environment | ERC8c | Wide dispersive indoor use resulting in inclusion into or onto a matrix |
| | ERC8f | Wide dispersive outdoor use resulting in inclusion into or onto a matrix |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 365 days/year |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Covers percentage substance in the product up to 1 % |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Remarks | not applicable |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 15 % |
| Compartment | sewage water |
| Emission or Release Factor | 1 % |

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

## 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Observe the rules usually applicable when handling chemicals. |

## 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC10<br>PROC19 |
| Value | 0.055 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |

| | |
|---|---|
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC11 |
| Value | 0.021 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC10 |
| Value | 49.2 mg/m3 |
| Remarks | > 4 hours |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC11 |
| Value | 0.33 mg/m3 |
| Remarks | > 4 hours |
| Calculation method | ConsExpo |
| Specific conditions | Consumers - dermal<br>PROC19 |
| Value | 0.55 mg/kg bodyweight/day |
| Remarks | > 4 hours |
| Calculation method | ConsExpo |
| Specific conditions | Consumers - inhalation<br>PROC19 |
| Value | 9.63 mg/m3 |
| Remarks | > 4 hours |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES8: Formulation and use of non-metal surface treatment solutions/dispersions**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU10 | Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| | SU13 | Manufacture of other non-metallic mineral products, e.g. plasters, cement |
| Product category | PC15 | Non-metal-surface treatment products |
| Process category | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| | PROC7 | Industrial spraying |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| | PROC13 | Treatment of articles by dipping and pouring |
| Article category | | not applicable |
| Cat. release to the environment | ERC2 | Formulation of preparations |
| | ERC5 | Industrial use resulting in inclusion into or onto a matrix |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Provide sufficient air exchange and/or exhaust in work rooms.
Refill and handle product only in closed system.
Take measures to prevent the build up of electrostatic charge.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
An operator controls the manufacturing processes and takes samples for analysis using recommended personal protection equipment see chapter 8.
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).
Mechanics repair and maintain manufacturing and dispersing equipment after complete emptying and cleaning the equipment.
Retain drowns in sealed storage pending disposal or for subsequent recycle.
Keep locked up. The product should only be handled by trained personnel.
Prevent unauthorized access.

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 200 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 200 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Registers proportion of substance in product up to 2%. |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 1000 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 7.5 % |
| Compartment | marine water |
| Emission or Release Factor | 4 % |

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been |

| | |
|---|---|
| | implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Soil | The expected exposure level is minimal. |
| Sediment | The expected sediment exposure level is minimal. |
| Remarks | See chapter 6: Environmental protection measures |

### 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Neutralization is normally necessary before waste water is discharged into water treatment plants.<br>Dispose of only in treatment plants with adapted bacteria. |

### 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC5 |
| Value | 0.07 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Specific conditions | workers, dermal<br>PROC8a |
| Value | 0.14 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b<br>PROC13 |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC5 |
| Value | 0.58 mg/m3 |
| Remarks | 15 minutes - 1 hour |

| | |
|---|---|
| | using local exhaust ventilation (or respiratory protection) |
| Specific conditions | workers, inhalation<br>PROC8a |
| Value | 0.01 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.14 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC13 |
| Value | 5.8 mg/m3 |
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES9: In situ non-metal surface treatment**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU11 | Manufacture of rubber products |
| | SU12 | Manufacture of plastics products, including compounding and conversion |
| | SU13 | Manufacture of other non-metallic mineral products, e.g. plasters, cement |
| Product category | PC15 | Non-metal-surface treatment products |
| Process category | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| | PROC7 | Industrial spraying |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| Article category | | not applicable |
| Cat. release to the environment | ERC3 | Formulation in materials |
| | ERC5 | Industrial use resulting in inclusion into or onto a matrix |

## 3. Application conditions

Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | 15 - 60 minutes/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 200 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 100 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Covers percentage substance in the product up to 1 % |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 1000 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | < 0.03 % |
| Compartment | sewage water |
| Emission or Release Factor | < 0.04 % |

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Personal protective measures | Wear personal protective equipment; see section 8. |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

## 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

## 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC5 |
| Value | 0.07 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC5 |
| Value | 0.97 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 0.14 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES10: Formulation of sealants**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU10 | Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| Product category | PC1 | Adhesives, sealants |
| Process category | PROC2 | Use in closed, continuous process with occasional controlled exposure |
| | PROC4 | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |

| | | |
|---|---|---|
| | PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| Article category | | not applicable |
| Cat. release to the environment | ERC2 | Formulation of preparations |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 200 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 200 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Registers proportion of substance in product up to 30%. |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 1000 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 2.5 % |
| Compartment | sewage water |
| Emission or Release Factor | 0.3 % |

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |

| | |
|---|---|
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

### 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

### 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

### 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC5 |
| Value | 0.07 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b<br>PROC9 |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC5 |
| Value | 0.97 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 1.4 mg/m3 |
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC9 |
| Value | 2.9 mg/m3 |
| Remarks | > 4 hours<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES11: Industrial use of sealants**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU5 | Manufacture of textiles, leather, fur |
| | SU6a | Manufacture of wood and wood products |
| | SU6b | Manufacture of pulp, paper and paper products |
| | SU12 | Manufacture of plastics products, including compounding and conversion |
| | SU13 | Manufacture of other non-metallic mineral products, e.g. plasters, cement |
| | SU15 | Manufacture of fabricated metal products, except machinery and equipment |
| | SU16 | Manufacture of computer, electronic and optical products, electrical equipment |
| | SU17 | General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| | SU19 | Building and construction work |
| Product category | PC1 | Adhesives, sealants |
| Process category | PROC7 | Industrial spraying |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| | PROC10 | Roller application or brushing |
| | PROC13 | Treatment of articles by dipping and pouring |
| | PROC14 | Production of preparations or articles by tabletting, compression, extrusion, pelletisation |
| | PROC21 | Low energy manipulation of substances bound in materials and/or articles |
| Article category | | not applicable |
| Cat. release to the environment | ERC8b | Wide dispersive indoor use of reactive substances in open systems |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

### 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 200 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 100 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Registers proportion of substance in product up to 10%. |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | 500 kg/day |

## 5. Other operational conditions

| | |
|---|---|
| Compartment | air |
| Emission or Release Factor | 0.1 % |

## 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

## 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |

| | |
|---|---|
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b |
| Value | 0.069 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC10 |
| Value | 0.28 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC13 |
| Value | 0.14 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC14 |
| Value | 0.034 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC8b |
| Value | 17 mg/m3 |
| Remarks | 1 - 4 hours |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC10<br>PROC13 |
| Value | 58 mg/m3 |
| Remarks | > 4 hours |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC14 |
| Value | 29 mg/m3 |
| Remarks | > 4 hours |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES12: Professional and consumer use in sealants**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU21 | Consumer uses: Private households (= general public = consumers) |
| | SU22 | Professional uses: Public domain (administration, |

| | | |
|---|---|---|
| | | education, entertainment, services, craftsmen) |
| Product category | PC1 | Adhesives, sealants |
| Process category | PROC10 | Roller application or brushing |
| | PROC19 | Hand-mixing with intimate contact and only PPE available |
| Article category | | not applicable |
| Cat. release to the environment | ERC8c | Wide dispersive indoor use resulting in inclusion into or onto a matrix |
| | ERC8f | Wide dispersive outdoor use resulting in inclusion into or onto a matrix |

## 3. Application conditions

Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

**Frequency of exposure**

| | |
|---|---|
| Long-term | 365 days/year |

**Annual site amount**

| | |
|---|---|
| Long-term | 0.5 tons |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Registers proportion of substance in product up to 10%. |

## 4.3 Amount used per time or per activity

**Daily use:**

| | |
|---|---|
| Value | ca. 1.4 kg/day |

## 5. Other operational conditions

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Personal protective measures | Wear personal protective equipment; see section 8. |

## 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Observe the rules usually applicable when handling chemicals. |

## 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |

| | |
|---|---|
| Air | No special measures. |
| water | Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Calculation method | ConsExpo |
| Specific conditions | Consumers - dermal |
| Value | 2.31 mg/kg bodyweight/day |
| Remarks | > 4 hours |
| Calculation method | ConsExpo |
| Specific conditions | Consumers - inhalation |
| Value | 3.28 mg/m3 |
| Remarks | > 4 hours |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES13: Laboratory reagent**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU24 | Scientific research and development |
| Product category | PC21 | Laboratory Chemicals |
| Process category | PROC15 | Use as laboratory reagent |
| Article category | | not applicable |
| Cat. release to the environment | | not applicable |

## 3. Application conditions

The samples are analyzed by laboratory technicians under an extraction hood.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep locked up. The product should only be handled by trained personnel.

## 3.1 Duration and frequency

**Laboratory worker**

| | |
|---|---|
| Long-term | < 10 grams / day |

**Duration of exposure**

| | |
|---|---|
| Long-term | < 15 minutes/day |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | not applicable |

## 4.3 Amount used per time or per activity

| | |
|---|---|
| Remarks | not applicable |

## 5. Other operational conditions

| | |
|---|---|
| Remarks | not relevant |

## 6. RISK MANAGEMENT MEASURES

### 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | < 15 minutes |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | < 15 minutes |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

### 6.1.2 Consumer related measures

### 6.2 Environment related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

## 7. Waste related measures

| | |
|---|---|
| Remarks | Not required |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC15 |
| Value | 0.034 mg/kg bodyweight/day |
| Remarks | < 15 minutes<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC15 |
| Value | 0.48 mg/m3 |
| Remarks | < 15 minutes<br>using local exhaust ventilation (or respiratory protection) |

## 9. Guidance to downstream user

No additional relevant information available.

## 1. Short title of exposure scenario

**ES14: Use in textiles**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU5 | Manufacture of textiles, leather, fur |
| | SU10 | Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| Product category | PC34 | Textile dyes, finishing and impregnating products; including bleaches and other processing aids |
| Process category | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| | PROC8b | Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. |
| | PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | PROC10 | Roller application or brushing |
| | PROC13 | Treatment of articles by dipping and pouring |
| Article category | | not applicable |
| Cat. release to the environment | ERC2 | Formulation of preparations |
| | ERC6b | Industrial use of reactive processing aids |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

### 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Short-term | 15 - 60 minutes/day |
| Remarks(Short-term) | PROC5 |
| | PROC8b |
| | PROC9 |
| Long-term | > 4 hours/day |
| Remarks(Long-term) | PROC10 |
| | PROC13 |

### 4.1 Physical form

**liquid**

### 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Registers proportion of substance in product up to 25%. |

**4.3 Amount used per time or per activity**

**5. Other operational conditions**

**6. RISK MANAGEMENT MEASURES**

**6.1.1 Occupational Measures**

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

**6.1.2 Consumer related measures**

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

**6.2 Environment related measures**

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

**7. Waste related measures**

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

**8. Prediction of exposure**

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC5 |
| Value | 1.4 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC8b<br>PROC9 |
| Value | 0.69 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal |

| | |
|---|---|
| | PROC10 |
| Value | 0.0014 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal<br>PROC13 |
| Value | 0.0068 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC5<br>PROC8b<br>PROC9 |
| Value | 9.7 mg/m3 |
| Remarks | 15 minutes - 1 hour |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC10 |
| Value | 0.39 mg/m3 |
| Remarks | 15 minutes - 1 hour<br>using local exhaust ventilation (or respiratory protection) |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, inhalation<br>PROC13 |
| Value | 3.9 mg/m3 |
| Remarks | 15 minutes - 1 hour |

## 9. Guidance to downstream user

No additional relevant information available.

---

## 1. Short title of exposure scenario

**ES16: Use in semiconductor and electronic manufacture**

## 2. Description of activities/process(es) covered in the Exposure Scenario

| | | |
|---|---|---|
| Sector of use | SU3 | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | SU10 | Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| | SU16 | Manufacture of computer, electronic and optical products, electrical equipment |
| Product category | PC9a | Coatings and paints, thinners, paint removers |
| | PC33 | Semiconductor |
| Process category | PROC2 | Use in closed, continuous process with occasional controlled exposure |
| | PROC5 | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| Article category | | not applicable |
| Cat. release to the environment | ERC5 | Industrial use resulting in inclusion into or onto a matrix |
| | ERC6b | Industrial use of reactive processing aids |

## 3. Application conditions

Automated and principally closed outdoor system with connection to a central waste gas system.
Refill and handle product only in closed system.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Dispose of contaminated wastewater in suitable treatment plants (with adapted bacteria).
Dispose of residual gases and unused gas by means of a suitable waste gas burning method
Filling / transfer procedures are carried out while wearing personal protection equipment as recommended (see chap. 8).

## 3.1 Duration and frequency

**Duration of exposure**

| | |
|---|---|
| Long-term | > 4 hours/day |

## 4.1 Physical form

**liquid**

## 4.2 Concentration of substance in preparation

| | |
|---|---|
| Remarks | Registers proportion of substance in product up to 25%. |

## 4.3 Amount used per time or per activity

## 5. Other operational conditions

## 6. RISK MANAGEMENT MEASURES

## 6.1.1 Occupational Measures

| | |
|---|---|
| Routes of exposure | dermal |
| Exposure time | Covers daily exposure up to 8 hours. |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Use product only in closed system. |
| Personal protective measures | see item 8 |
| Routes of exposure | inhalation |
| Exposure time | Comprises daily exposure from 15 minutes to 1 hour |
| Organizational protective measures | Assumes a good basic standard of occupational hygiene has been implemented. |
| Technical protective measures | Handle substance within a predominantly closed system provided with extract ventilation. |
| Personal protective measures | If workplace exposure limit is exceeded apply Respiratory protective equipment.<br>Wear personal protective equipment; see section 8. |

## 6.1.2 Consumer related measures

| | |
|---|---|
| Remarks | Not relevant for this exposure scenario. |

## 6.2 Environment related measures

| | |
|---|---|
| Exposure time | Includes daily exposure. |
| Air | No special measures.<br>Dispose of waste gases in a suitable incineration plant. |
| water | Prevent substance from entering water.<br>Dispose of only in treatment plants with adapted bacteria. |
| Remarks | See chapter 6: Environmental protection measures |

## 7. Waste related measures

| | |
|---|---|
| Waste treatment | With respect to local regulations, e.g. deposit in a suitable landfill site or |

| | |
|---|---|
| | dispose of to suitable waste incineration plant. |
| Remarks | Dispose of only in treatment plants with adapted bacteria. |

## 8. Prediction of exposure

| | |
|---|---|
| Specific conditions | workers, oral |
| Remarks | No significant oral exposure |
| Calculation method | ECETOC TRA |
| Specific conditions | workers, dermal |
| Value | 0.5 mg/kg bodyweight/day |
| Remarks | > 4 hours<br>using personal protection equipment |

## 9. Guidance to downstream user

No additional relevant information available.